REMARKS/ARGUMENTS

Election/Restrictions

The final nature of the restriction requirement is acknowledged. In consequence, claims 33 to 44 have now been cancelled from this application without prejudice.

Claim Rejections – 35 USC § 112

The Examiner rejected claim 11 as directed to subject-matter not described in the specification in such a way as to reasonably convey that the inventors had possession of the claimed invention. While Applicant does not necessarily agree with this rejection, claim 11 has been cancelled for convenience of future prosecution.

Claim Rejections – 35 USC § 102

The Examiner rejected claims 1-4, 6-14, 16, 18, 20, 23, 24, 27, 29-31 as being clearly anticipated by Fan et al. (US 6,444,467). Reconsideration of this rejection is requested for the following reasons.

Fan et al. discloses a process in which somatic embryos are pre-germinated and desiccated, and then the dried germinants are sown directly into soil (or a soil equivalent), preferably covered with a thin layer of solid (e.g. coir) and then fed with a liquid nutrient solution in the form of a mist, droplets or by irrigating or drenching. The pre-germination step is carried out *in-vitro* and the sowing step is carried out *ex-vitro*. The pre-germination step is carried out in sterile conditions and the sowing step is non-sterile. In contrast, in the present invention, somatic embryos or germinants (which do not have to be dried or desiccated) are sown in ex-vitro, non-sterile conditions directly onto soil or a soil equivalent, but in contact with a nutrient medium comprising a flowable component and particles of a solid component. The solid component provides physical support for the seedling as it develops, even after the flowable component has dissipated. This is clearly shown in the illustrations of Figs. 1 to 5 of the drawings of the present application. Fig. 3 of these drawings is duplicated below as well as a new figure (Fig. X) that represents one form of the invention of Fan et al.:

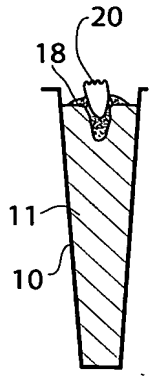


Fig. 3

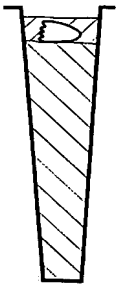


Fig. X

The nutrient medium of the present invention is item 18 shown in Fig. 3. This is a gel-like substance that contains solid particles. The medium 18 helps to anchor the embryo 20 in the correct upright orientation both while the flowable component is present and also after the flowable component dissipates, leaving the solid component. Additionally, the medium provides nutrient to the embryo. In contrast, in Fan et al., the embryo is sown naked on or in the surface of a soil-like medium and may then be loosely covered with a layer of solid, e.g. coir. The germinant is then supplied with a liquid nutrient solution by misting, irrigation, etc. This form of sowing does not provide any direct support for the embryo, and the nutrient has to be supplied separately. The present invention provides a greater likelihood that the embryo will develop into a healthy seedling growing in the correct orientation.

There is no disclosure in Fan et al. of the use of a nutrient medium containing a flowable component and a solid component during the planting step. It should be kept in mind that claim 1 of the present application requires a quantity of the nutrient medium to be dispensed onto a surface of a porous solid growth substrate (soil or soil-like material). This is not disclosed in Fan et al.

The Examiner refers to column 8, line 28 of Fan et al. to support the sowing of naked embryos. Fan et al. may use naked embryos, but they are sown directly into soil or soil-like

material (which Fan et al. refer to as a three-phase substrate, the phases consisting of solid, liquid and gas, as mentioned at column 3, lines 62 to 63 – which is descriptive of conventional soil).

The Examiner refers to column 4, line 10 as support for the presence of 1-9% sucrose in the nutrient medium, but this passage refers to the pre-germination step carried out in in-vitro conditions prior to the sowing step, and thus has nothing to do with sowing.

Column 8, lines 50-51 are said to refer to various solid components, but again this relates to the pre-germination step of Fan et al.

Column 8, lines 43-44 and lines 59-67 are referred to as support for the concept that the somatic embryos may be held at or above the surface of the medium by means of a physical support, such as polypropylene materials, and placed in contact with a liquid medium, but again this relates to the pre-germination step of Fan et al. and not to the sowing step.

Column 9, lines 12-16 are referred to as support for the proposition that Fan et al. contemplates sowing in a wide variety of growing substrates. This is not disputed, but in Fan et al., the embryos are sown directly onto or in such substrates and there is no associated use of a flowable nutrient composition as explained above.

Various other passages of Fan et al. were referred to by the Examiner as disclosing the use of fungicides etc., plant growth regulators etc., solid components with elongated particles, and various pine species, etc. Again, this is not disputed, but, in the absence of providing a flowable nutrient medium as required in the present invention, this is not relevant, and nor is the fact that Fan et al. may provide a depression in the growth substrate.

In short, Fan et al. fails to disclose the requirement of claim 1 that a quantity of nutrient medium onto the surface of a growth substrate in contact with the plant embryo, the medium comprising particles of a solid component contained in a flowable component. For this reason, it is believed that the claims identified by the Examiner should not be considered anticipated by Fan et al. and reconsideration is requested.

It should additionally be pointed out that the present invention cannot be considered obvious over Fan et al. taken alone. As noted above, Fan et al. is entirely silent regarding the dispensing of a flowable nutrient solution onto a solid growth support during sowing of somatic embryous so that the embryos receive both nutrient and enduring physical support. In Fan et al., the nutrient is applied in the form of a solution by misting, fogging, drenching etc. Such a process would not work with a nutrient solution thickened not only be the presence of a gelling

agent or the like, but also by the presence of a solid component made up of solid particles. A person skilled in the art would realize that such a substitution of nutrient media would not work and would therefore not be tempted to make such a change. There is certainly no suggestion in Fan et al. that solid particles should be mixed with the nutrient solution and there would be no motivation to do so. There is not even any discussion in Fan et al. of the problem of seedlings toppling or becoming mis-aligned during growth, so there would be no motivation to modify the process of Fan et al. to ameliorate such a problem.

In short, nothing in Fan et al. leads to or suggests the present invention as defined by claim 1.

Claim Rejections – 35 USC § 103

The Examiner rejected claims 15, 17, 19 and 32 as obvious over Fan et al. in view of Pierik (In Vitro Culture of Higher Plants 1997).

The Examiner acknowledged that Fan et al. fails to disclose nutrient media containing gelling agents, but maintained that Pierik teaches nutrient media comprising agar to form a gel (page 55).

Pierik describes general *in-vitro* plant tissue culture principles commonly used in tissue culture laboratories. These processes could be used, for example, to develop the mature embryos used by Fan et al. that are subsequently germinated using methods in the Fan et al. reference. However, Pierik does not describe techniques for *ex-vitro* nursery growing of tissue cultured plants of any type, and certainly not somatic embryos.

The Examiner has stated that it would have been obvious to modify the method of Fan et al. by adding agar mixed with the nutrient medium knowing that gelling agents serve as binding agents for nutrient and water. This is believed to be incorrect.

From the discussion of Fan et al. provided above (discussing the 102 rejection), the method of Fan et al. involves planting the embryos naked in growth substrate, preferably covering the embryos with a layer of solid (e.g. coir), and then supplying nutrient dissolved in a liquid via misting, irrigation or the like, to drench the substrate and embryos. This would not be possible if a gelling agent were mixed with the nutrient solution as it would not be possible to apply a gelled medium by misting, irrigation, etc. Moreover, even if a gelled liquid could be

applied in this way, the resulting medium would be unlikely to penetrate the layer of solid overlying the embryos, and thus would not be able to supply nutrient to the embryos.

It should also be kept in mind that the claims of the present application require the nutrient medium to comprise a flowable component and a solid component, wherein the solid component is capable of providing physical support. Pierik does not disclose a nutrient medium containing the required solid component (solid particles) and merely discloses the use of agar to form a gel which, if sufficiently flowable, could only constitute the flowable component of the nutrient medium of the present application.

The Examiner has stated that a person skilled in the art would be motivated to add a gelling agent to the nutrient medium of Fan et al. because such addition would lower the maintenance of the germinant as no added water or nutrient will be needed because they will be contained within the gelling agent. As noted above, such an addition would not allow the process of Fan et al. to work because the nutrient medium could not contact the embryos. It should also be noted that Fan et al. stresses the need for high humidity conditions (column 10, lines 13-17) at least during the first 3-7 days after sowing. This can be achieved by the use of misting or fogging equipment. A person skilled in the art would not see the provision of a gelling agent in the nutrient medium as assisting with the maintenance of such high humidity conditions as the vapour pressure of a liquid trapped in a gel is lowered.

For these reasons, it is believed that the subject matter of the rejected claims is unobvious over the combination of Fan et al. and Pierik.

The Examiner also rejected claims 21, 22, 25, 26 and 28 as unpatentable over Fan et al. in view of Gupta (US 5,563,061) and Tremblay (Plant Cell, Tissue and Organ Culture 42: 39-46, 1995).

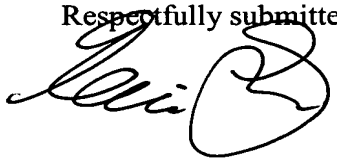
The rejected claims relate specifically to the nutrients employed in the nutrient media of the present invention. The Examiner acknowledges that Fan et al. fail to teach the use of monosaccharides and maltose. The Examiner points out that Tremblay teaches monosaccharides, oligosaccharides, and combinations, and Gupta teaches maltose as nutrients. The Examiner therefore maintains that it would be obvious to combine the teachings of Fan et al., Tremblay and Gupta to lead to the claimed invention.

Gupta and Tremblay describe the use of various carbohydrates in liquid solution for bulking up immature cells, not mature embryos capable of germination. It is not reasonable to assume that methods used for sterile in-vitro cell culture could be used in germination of mature embryos in nursery conditions in non-sterile environments. The conditions required for cell culture are not the same as those required for germination and a person skilled in the art would not assume that conditions intended for one could merely be transferred to the other.

In any event, the claims rejected by the Examiner are all dependent directly or indirectly on claim 1 and, for the reasons given above, it is believed that the invention of claim 1 is neither disclosed in, nor obvious from, Fan et al. because Fan et al. does not contemplate the use of a nutrient medium comprising a flowable component and a solid component dispensed onto a solid growth substrate. Neither Tremblay nor Gupta disclose or suggest such a step, so it is not seen that the combination suggested by the Examiner undermines the patentability of any of the claims of the present application, including claims 21, 22, 25, 26 and 28.

In view of the above arguments and amendments, favourable reconsideration of this application is requested.

Respectfully submitted,



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